Volunteer Lake Assessment Program Individual Lake Reports

CONTENTION POND, HILLSBOROUGH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,984	**Max. Depth (m):**	9.9	**Flushing Rate (yr^{1})**	2.9
Surface Area (Ac.):	95	**Mean Depth (m):**	4.2	**P Retention Coef:**	0.53
Shore Length (m):	2,900	**Volume (m^{3}):**	1,605,000	**Elevation (ft):**	857

TROPHIC CLASSIFICATION

Year	Trophic class
1985	MESOTROPHIC
2004	MESOTROPHIC

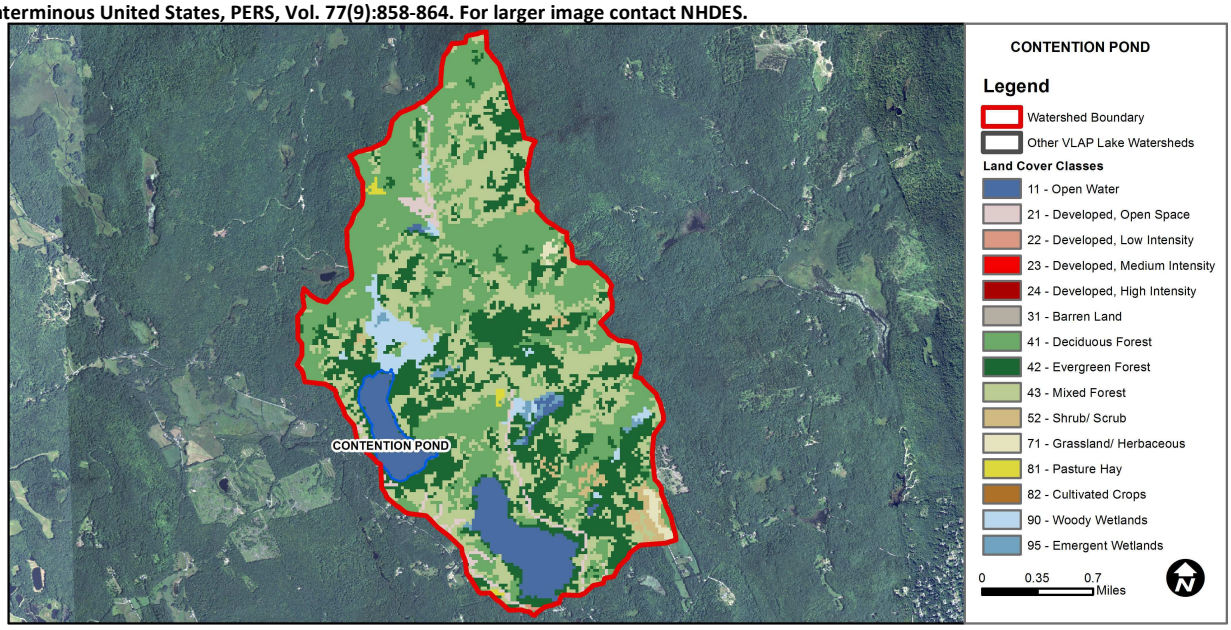
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.39	Barren Land	0.02	Grassland/Herbaceous	0.57
Developed-Open Space	2.11	Deciduous Forest	32.14	Pasture Hay	0.3
Developed-Low Intensity	0.04	Evergreen Forest	23.99	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	27	Woody Wetlands	2.95
Developed-High Intensity	0	Shrub-Scrub	1.75	Emergent Wetlands	0.7

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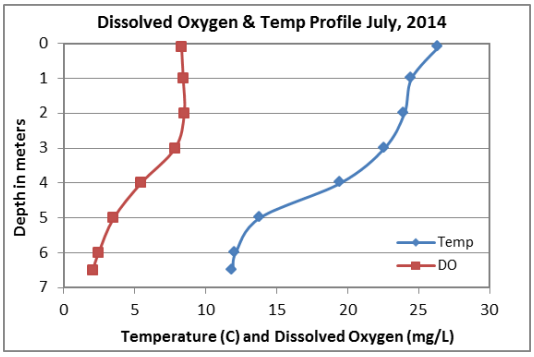
Contention Pond, Hillsborough

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were elevated in July, greater than the state median, and the highest measured since monitoring began. However, chlorophyll levels were less than 15.0 ug/L and not indicative of an algal bloom. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot and tributary conductivity and chloride levels were low and less than the state medians. Historical trend analysis indicates relatively stable epilimnetic (upper water layer) conductivity with moderate variability between years.
- **Total Phosphorus:** Epilimnetic, metalimnetic (middle water layer) and hypolimnetic (lower water layer) phosphorus levels were low and less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. North Inlet phosphorus levels were low and phosphorus has decreased in North Inlet since monitoring began. Outlet and South Inlet phosphorus levels were also low.
- **Transparency:** Transparency measured without the viewscope (NVS) was lower (worse) than average and less than the state median. The elevated algal growth could have affected the transparency, however transparency measured with the viewscope (VS) was much better than that measured without and was better than the state median. The viewscope transparency may be a better representation of actual conditions than non-viewscope transparency. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was low, metalimnetic turbidity was slightly elevated likely due to a layer of algae at that depth. Hypolimnetic turbidity was lower than average for that station.
- **pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units, however metalimnetic and hypolimnetic pH levels were less than desirable. North Inlet pH levels were less than desirable and likely a result of wetland influences. Outlet and South Inlet pH levels were within the desirable range. Historical trend analysis indicates highly variable epilimnetic pH since monitoring began.
- **Recommended Actions:** Chlorophyll levels were elevated in July however phosphorus levels were low at the time of sampling. Pond phosphorus levels could have been elevated in June to fuel the July algal growth. This supports the recommendation to increase monitoring frequency to once per month during the summer, typically, June, July and August. This will help to better understand seasonal and historical water quality trends and decrease variability within the data set.



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Station Name	Table 1. 2014 Average Water Quality Data for CONTENTION POND								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	3.1	7.83	3	19.8	7	2.75	5.25	0.86	6.62
Metalimnion				19.9	9			1.54	6.30
Hypolimnion				21.0	10			1.78	6.00
North Inlet			3	17.0	7			0.85	6.33
Outlet				19.0	6			0.75	6.67
South Inlet			3	20.0	7			0.98	6.73

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.